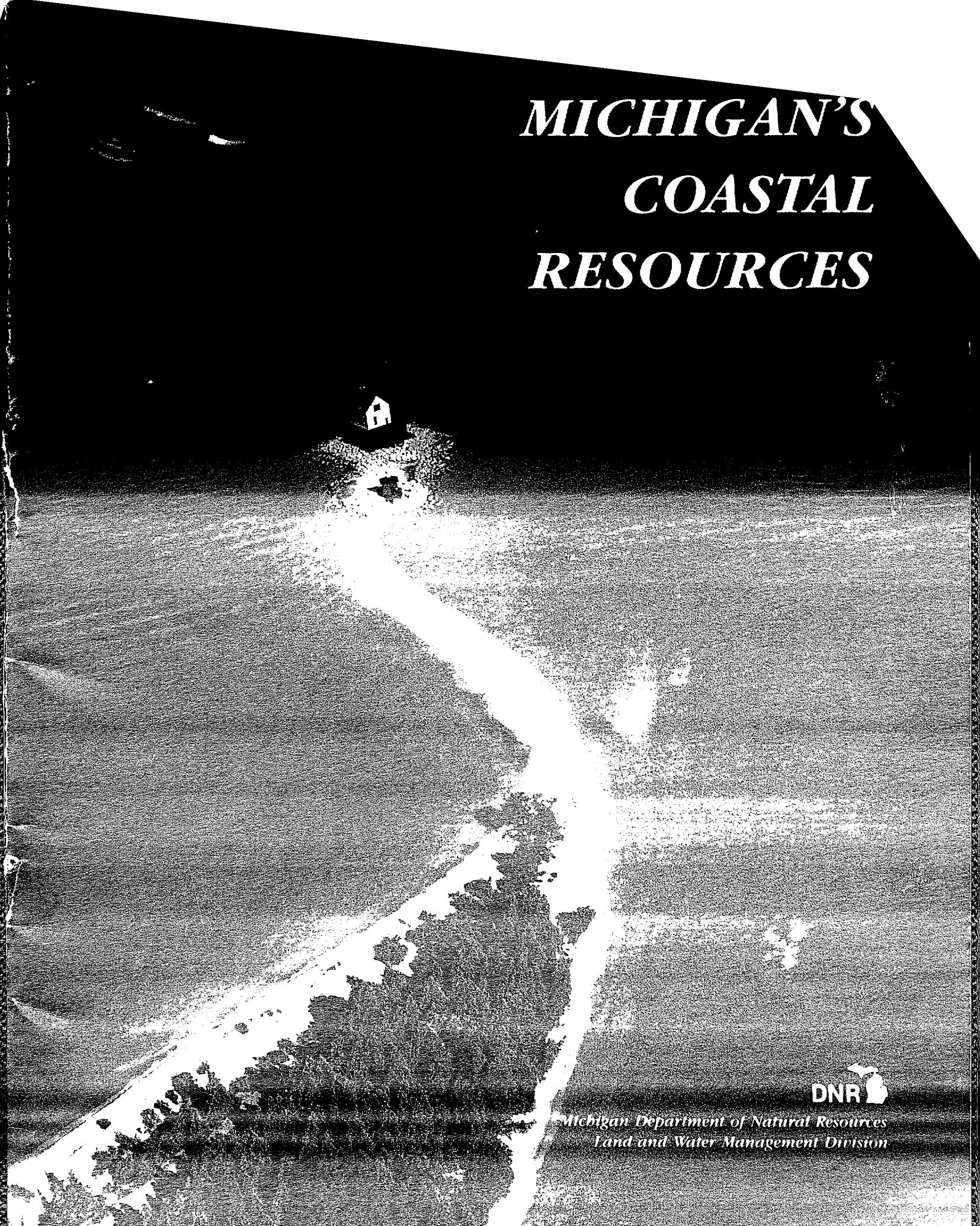
MICHIGAN'S COASTAL RESOURCES



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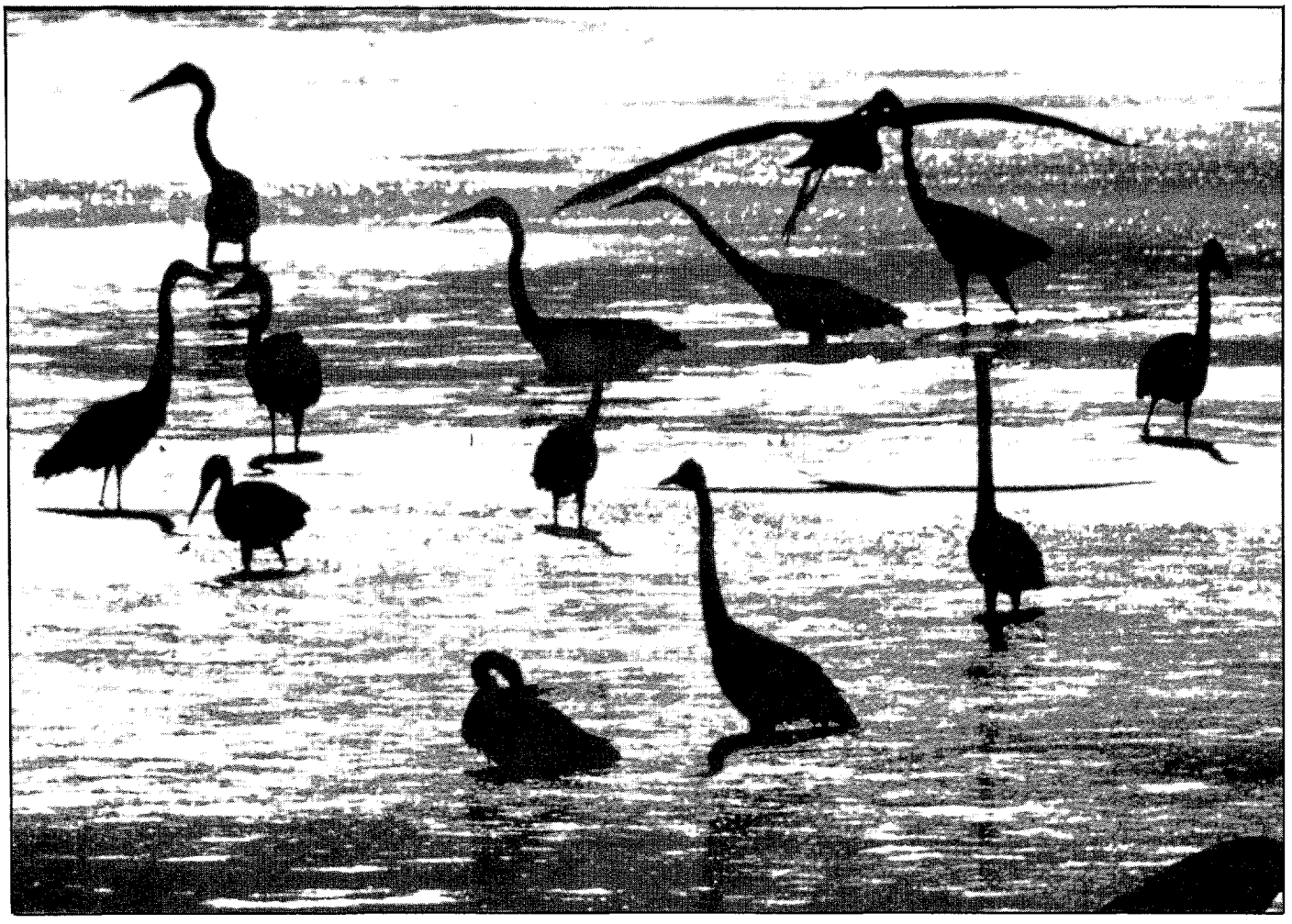
Michigan Department of Natural Resources
Land and Water Management Division



Dave Kenyon

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prepared by:

Michigan Department of Natural Resources
Land and Water Management Division

DNR

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Photo opposite page and inside back cover by Tom Powers

Dave Kenyon

For centuries Native Americans such as these whitefish anglers at Sault Ste. Marie fished Michigan's shorelines.

Dave Kenyon

Providing public access and enhancing recreational opportunities are two goals of the CZM program.

The Coastal Zone and the CZMA

The coastal zone is that dynamic area where land meets the sea or Great Lakes. The United States contains more than 95,000 miles of diverse coastlines, including bays, harbors, beaches, wetlands, islands and estuaries. The coastal zone ecosystems are the richest and most productive of all our natural resources. But they are also among the most fragile and threatened.

Today, half of all Americans live near the oceans or within the Great Lakes watershed. By the end of the 20th century, perhaps eight of every 10 will reside within an hour's drive of a coastline. Within Michigan no one is ever farther than 85 miles from a Great Lakes shoreline.

In 1972 Congress enacted the Coastal Zone Management Act (CZMA) to improve the nation's control over its coastal resources. Many shorelines were being permanently damaged because of poorly planned development. Major problems included—and still include—erosion, the loss of plants and animals and their specialized habitats, conflicts between users of the resource, and the decreasing amount of open space for public use. The legislation's purpose is "to restore or enhance the resources of the nation's coastal zone for this and succeeding generations."

The overall goal of the CZMA is to guide participating states into developing comprehensive management programs. Through a federal-state partnership, the states are charged with taking the lead in management. The federal government's role is to provide technical and financial assistance on a dollar-for-dollar match with the states. It is the state's responsibility to oversee all activities—including those of the federal government—to ensure consistency within the state management program.

The states are not required to participate. However, of the 35 that are eligible, 29 currently do. Michigan began managing its natural resources nearly 100 years ago, and its CZM commitment dates to 1974 when it was among the earliest to join the federal partnership. Michigan quickly emerged as a leader and a demonstration state for innovative programs, which other states have since modeled.

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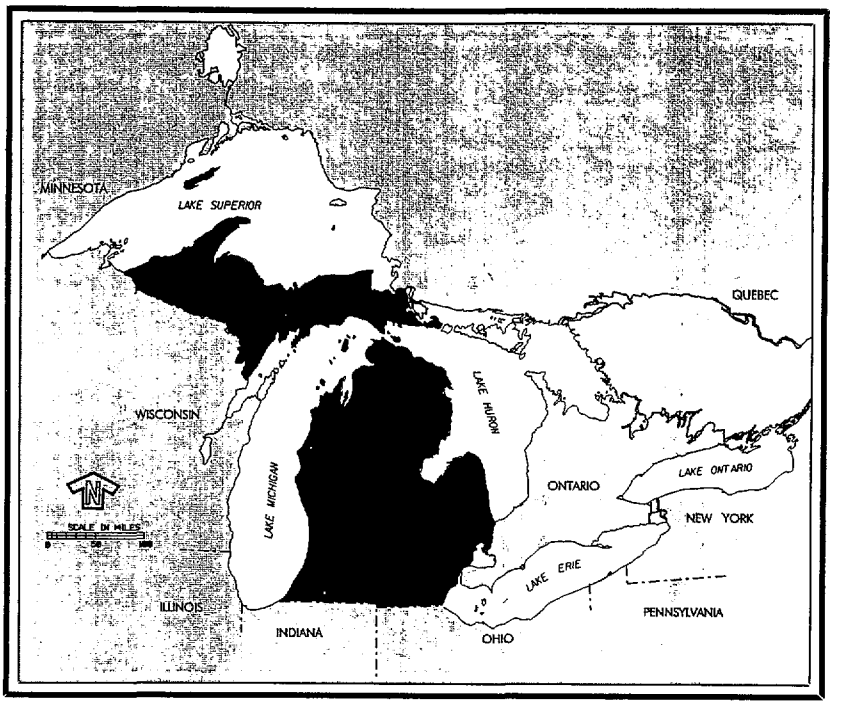
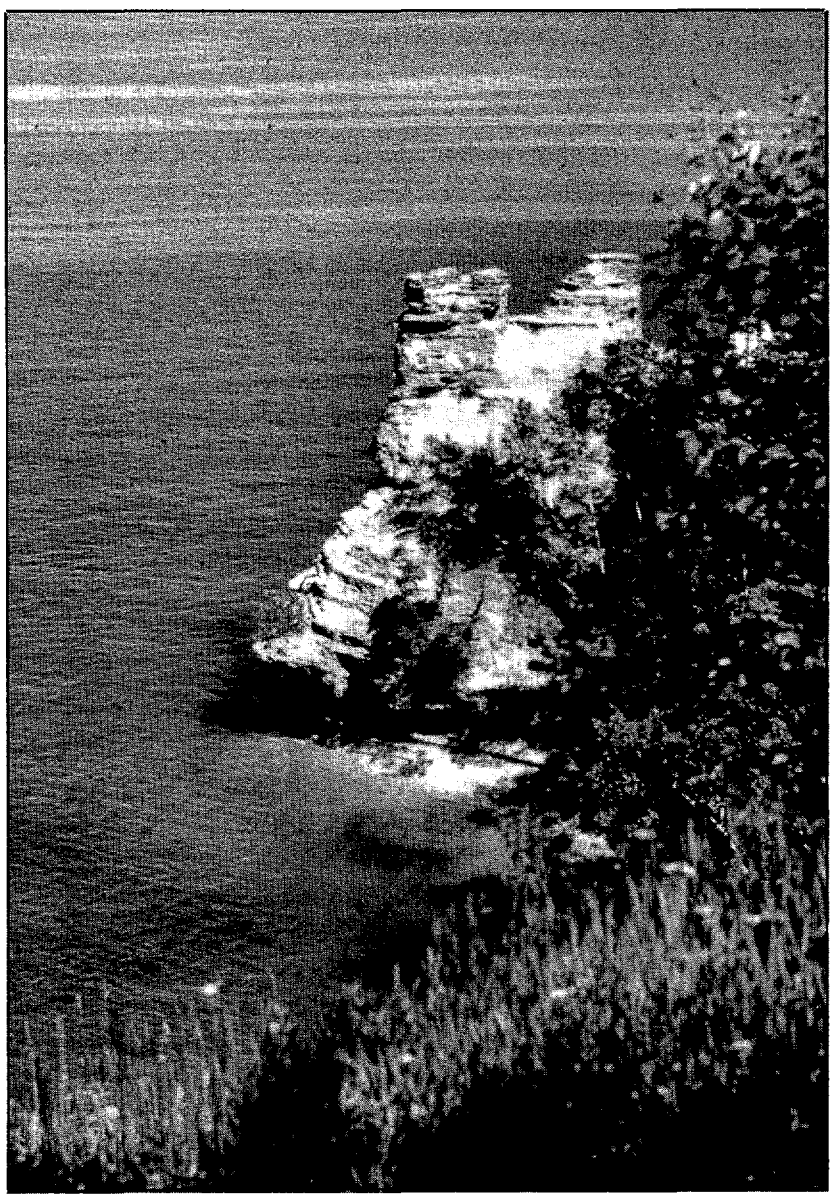


Michigan's Coastline—A National

Our state's shoreline region is a national treasure, rivaling the nation's seacoasts for diversity and beauty.

"If you seek a pleasant peninsula, look about you." First incorporated into the state seal in 1837, the maxim is true yet today. Michigan's frontage on Lakes Superior, Michigan, Huron and Erie totals 3,288 miles, including connecting waterways and islands. It is the longest freshwater coastline in the world, and it is greater than the holdings of any other state except Alaska.



Bruce Vollmar

The shorelines include rugged outcroppings such as Miners Castle in the Pictured Rocks National Shoreline.

Michigan's coastal zone includes drowned river mouths, bays, inlets, marshes, beaches, dunes, bluffs and coastal uplands. It is comprised of many unusual physical and geologic features found nowhere else in the world. Consider the state's 270 miles of sand dunes comprising 275,000 acres. Collectively they represent the largest accumulation of sand dunes along any fresh water body in the world.

Our state's shoreline region is a national treasure, rivaling the nation's seacoasts for diversity and beauty. The barren rocky shore of Lake Superior resembles the rugged headlands of both Maine and Oregon. The marshes of Lake Erie, Lake St. Clair and Saginaw Bay are similar to those of Chesapeake Bay. Lake Michigan's sugar-sand beaches bring to mind the sun-kissed shores of Florida, southern California and Texas. However, there is a difference: Michigan's "sweet-water seas," as they were named by an early explorer, contain fresh water, not salt water.

About 30 percent of Michigan's shorelines are publicly owned, more than double that of the other seven states with Great Lakes frontage. Our shorelines provide a tremendous amount of recreational diversity for rockhounds, sunbathers, hikers, picnickers, surf anglers, bird watchers and dune explorers. Scuba diving, sailing, power boating, swimming and fishing are among many popular offshore activities.

About one-third of the more than 700,000 Michigan registered boaters, more than any other state, rely on the

Treasure

Great Lakes for recreation. More than 1.3 million people fish there each year and directly contribute upwards of $500 million to the state's economy. Only anglers in California, Florida and Texas spend more. Boaters, anglers and others benefit greatly from Michigan's 67 harbors of refuge, more than 200 public access sites, 41 state parks and their 114 miles of shoreline, and dozens of county and municipal parks.

State parks along Lake Michigan at Holland, Grand Haven and Warren Dunes each receive more than a million visitors annually. In addition, the National Park Service manages more than 100 miles of shoreline at Sleeping Bear Dunes National Lakeshore on Lake Michigan and Pictured Rocks National Lakeshore on Lake Superior. Isle Royale National Park in Lake Superior contains 210 square miles and includes 200 surrounding smaller islands.

Our shorelines are special indeed.

About one-third of the more than 700,000 Michigan registered boaters, more than any other state, rely on the Great Lakes for recreation.

Michael Kessler

Projects funded by the CZM program have contributed greatly to local and regional economic growth. These are charter fishing boats at Grand Haven's Chinook Pier.

Why the Coastal Zone Must Be Ma

Whenever our nine million citizens use water, the impact ultimately affects the Great Lakes.

The Great Lakes contain more than 95,000 square miles of surface water—about one-fifth of the world's fresh water supply. Michigan's control of some 40 percent of the water in the Great Lakes is an incredible amount, and that is why water is our most valuable asset. Today, about half of the people living in more than 100 Michigan cities and communities depend on this water for drinking and sanitation purposes. For these and other uses, experts estimate that each resident requires about 1,000 gallons of water each day on the average.

Whenever our nine million citizens use water, the impact ultimately affects the Great Lakes. That is because more than 11,000 inland lakes and 36,000 miles of streams contribute to many interior watersheds. Most empty into the Great Lakes via 242 tributaries, all but 16 of which are located entirely within Michigan.

Great Lakes water is used for many purposes besides human consumption. Industry needs it for manufacturing processes. Hydroelectric, nuclear and fossil fuel power generating plants all use water. Farmers rely on it for irrigation and for watering their livestock. Thousands of commercial vessels probe Michigan's 40 active harbors and ports and ply its shipping lanes. In a typical year they will move an astounding 100 million tons of cargo.

When the explorer Etienne Brule' reached the Upper Great Lakes nearly 400 years ago, the coastlands looked much like uninhabited portions do yet today. For more than 7,000 years the Ojibwa, Chippewa, Menominee and other native people had done nothing to change the shoreline areas where they often lived in villages. The large influx of settlers, many of whom built port communities during

Blanchard Mills

Year-round shipping on the Great Lakes could cause irreparable harm to Michigan's coastal zone.

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Detroit News Photo

Periodic high water levels in Lake Erie and other Great Lakes have caused extensive damage to the natural shoreline as well as to buildings and other structures.

the immigration wave of 1830 to 1840, began to have an immediate local impact. Log booms, sawdust and wood chips clogged the rivers. Harbors were dredged to permit shipping. Mining operations for precious metals, gypsum, limestone, salt and sand sprang up.

Overfishing by commercial netters and the depletion of the northern forests demonstrated how quickly humans could negatively impact natural resources. River and harbor pollution from residents, industry and agriculture also occurred at a rapid pace. The Industrial Revolution of the late 19th century found dramatic expression in Michigan, which soon became the world's automobile capitol. These and other activities began to harm its sensitive coastal area.

The ecological edge that is Michigan's shorelines provides for a transition zone where unusual climate and soils support a rich mixture of plant and animal life. Specialized plants such as pitcher's thistle and sand reed grass grow there. Cormorants, piping plovers and other rare birds and animals live there. By its very complexity, the state's coastlands are also extremely fragile. Because of their attraction to both recreationists and developers seeking commercial gain, the shorelines demand wise management and, in some cases, protection.

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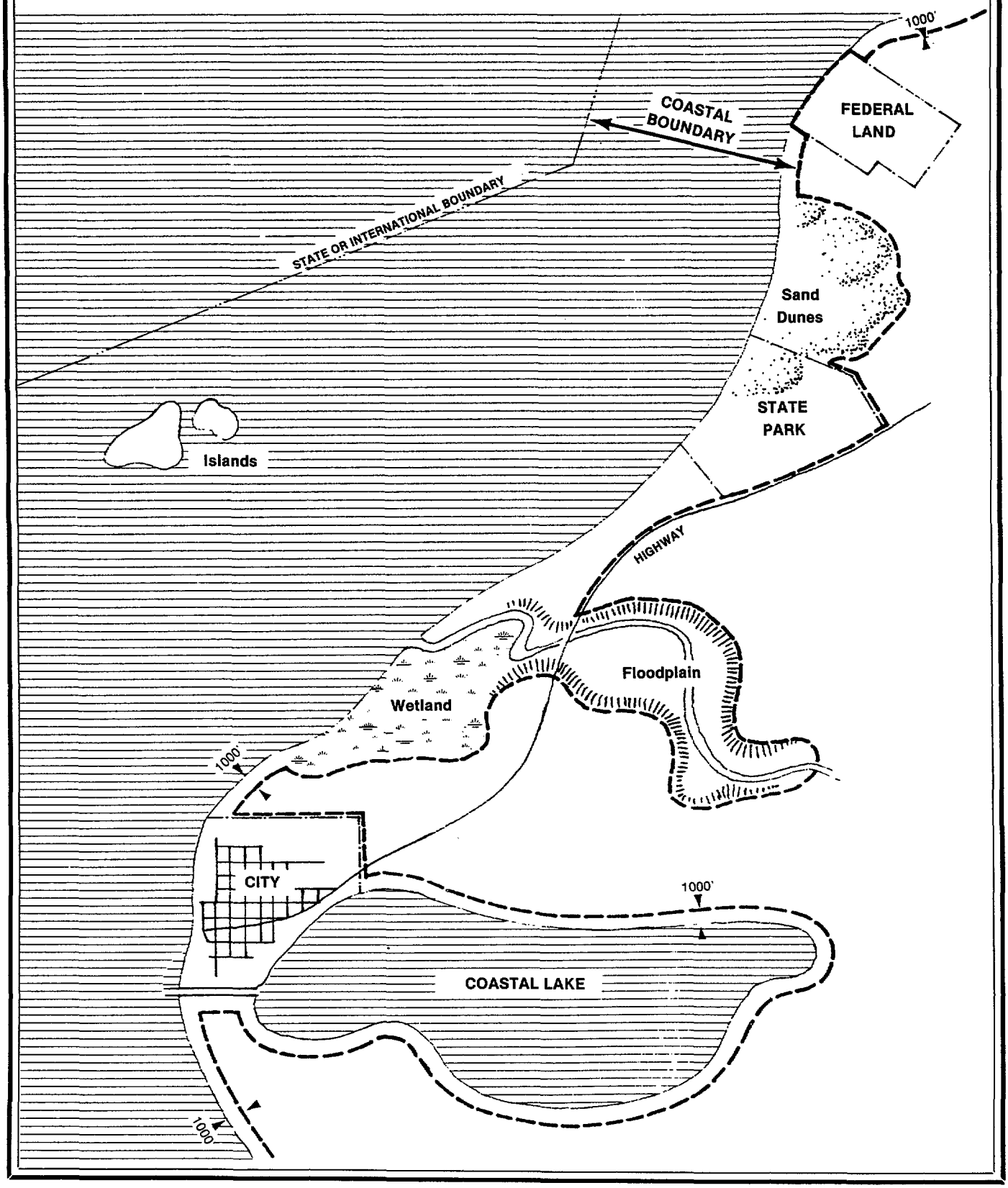
SCHEMATIC DIAGRAM
OF THE MICHIGAN COASTAL MANAGEMENT PROGRAM BOUNDARY



The Core Statutes

In recent years the state legislature has adopted several core statutes that give the Department of Natural Resources (DNR) authority over the coastal zone. These statutes exist not for the purpose of submitting people to a regulatory bureaucracy but to protect and manage the resource in a consistent and responsible way. The statutes further help the DNR to resolve the increasing number of conflicts that arise from multiple-use demands of the resource.

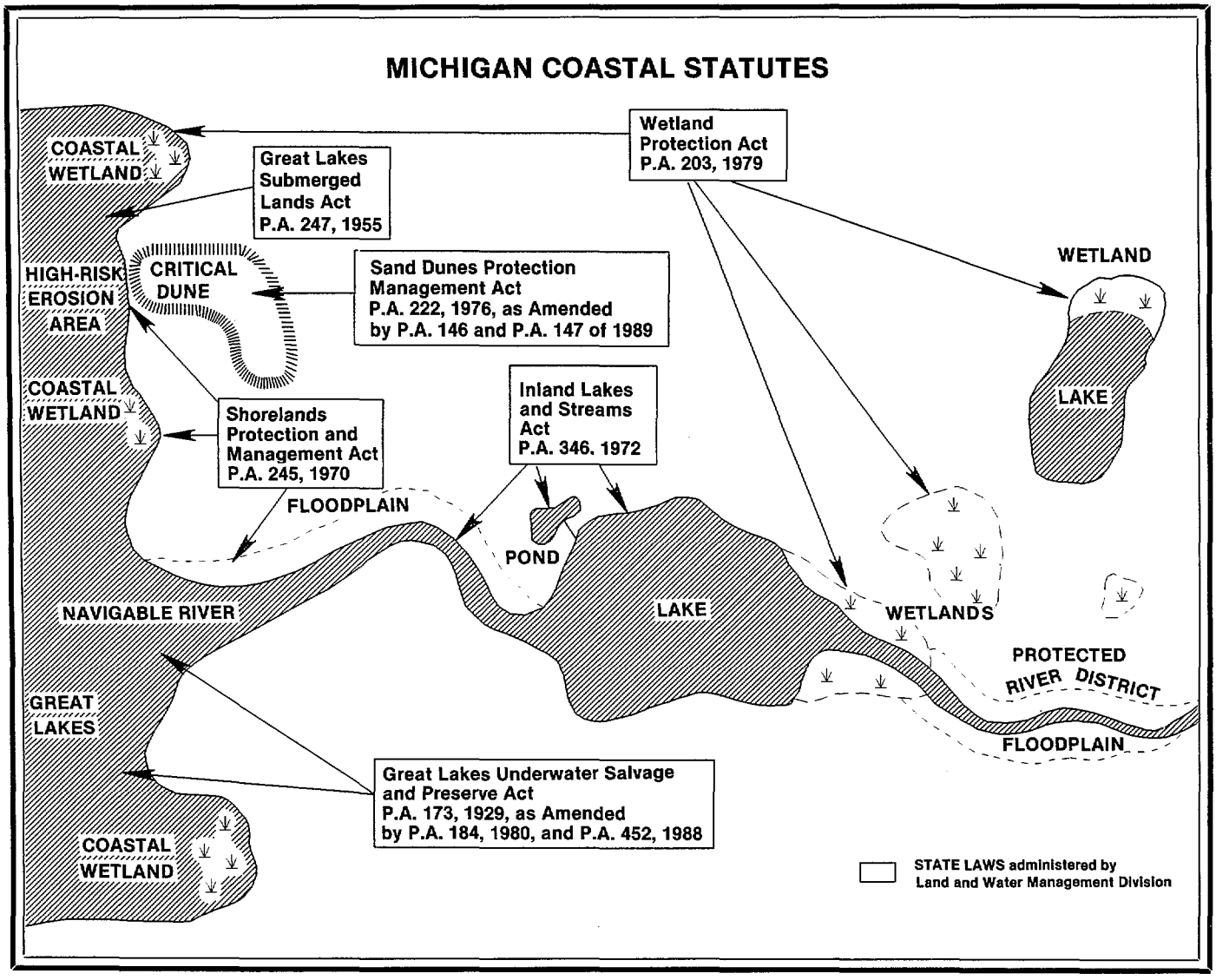
Michigan's fragile sand dunes are now protected from unregulated mining.

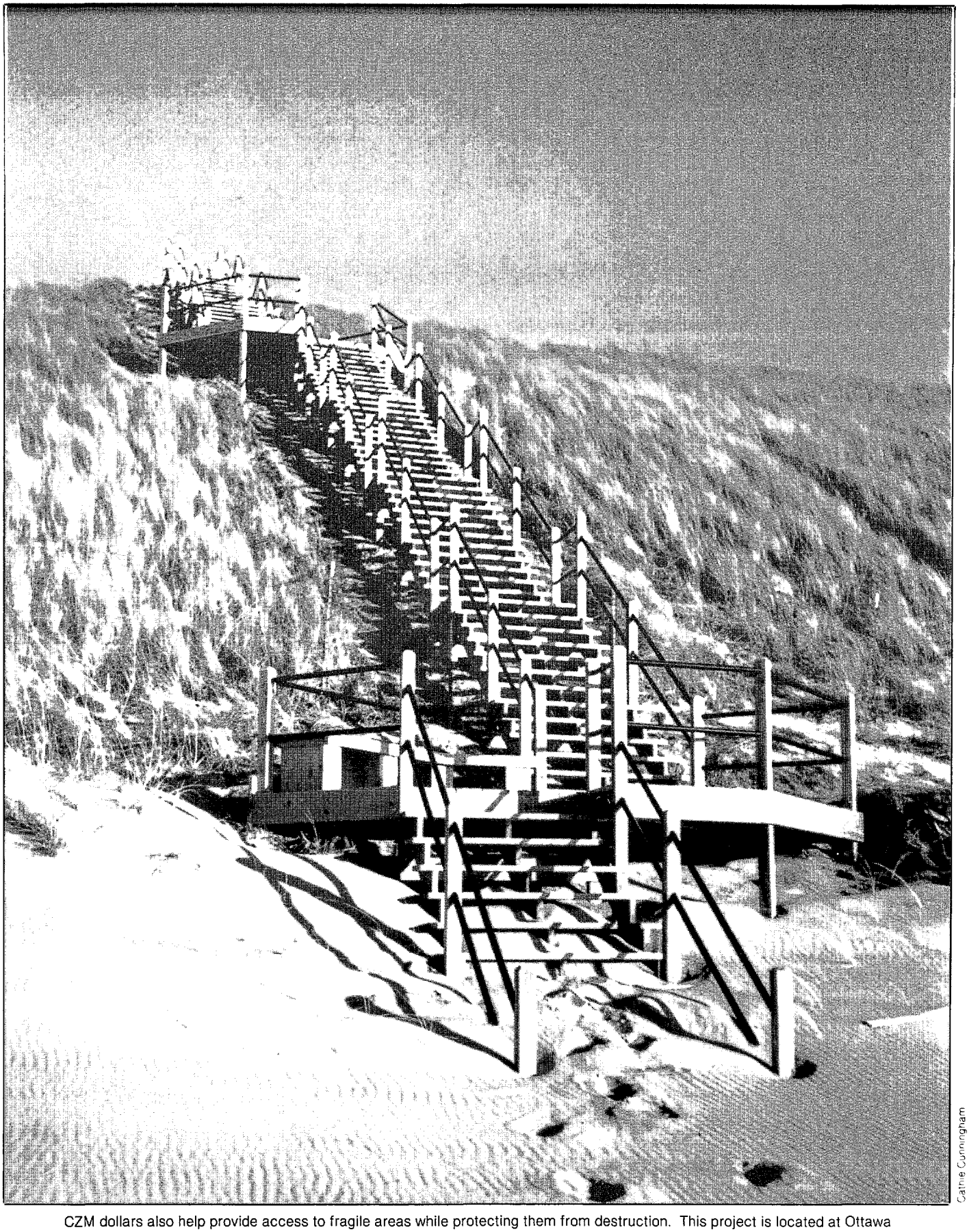
These statutes exist not for the purpose of submitting people to a regulatory bureaucracy but to protect and manage the resource in a consistent and responsible way.

The **Great Lakes Submerged Lands Act** (Public Act 247, approved in 1955) establishes a fixed elevation, referred to as the "ordinary high water mark" as the landward boundary of state-owned bottomlands. The law protects Michigan's harbors, bays, channels and other bottomlands from uncontrolled dredging and filling. It also allows the wise and careful development of bottomlands while requiring the DNR, through a permit-review process, to protect sensitive areas.

The **Shorelands Protection and Management Act** (Public Act 245, 1970) charges the DNR with protecting environmental areas, high risk erosion areas and flood risk areas. Responsibilities include providing criteria for altering the shoreline and for building setbacks from erosion-prone areas.

The **Inland Lakes and Streams Act** (Public Act 346, 1972) regulates activities in coastal lakes and tributaries that have a hydrologic connection to the Great Lakes. Further, it protects inland streams and lakes larger than five acres from unauthorized dredging, filling or construction of permanent structures below the ordinary high water mark. The law also requires a permit for dredging within 500 feet of a lake or stream.





Cathie Cunningham

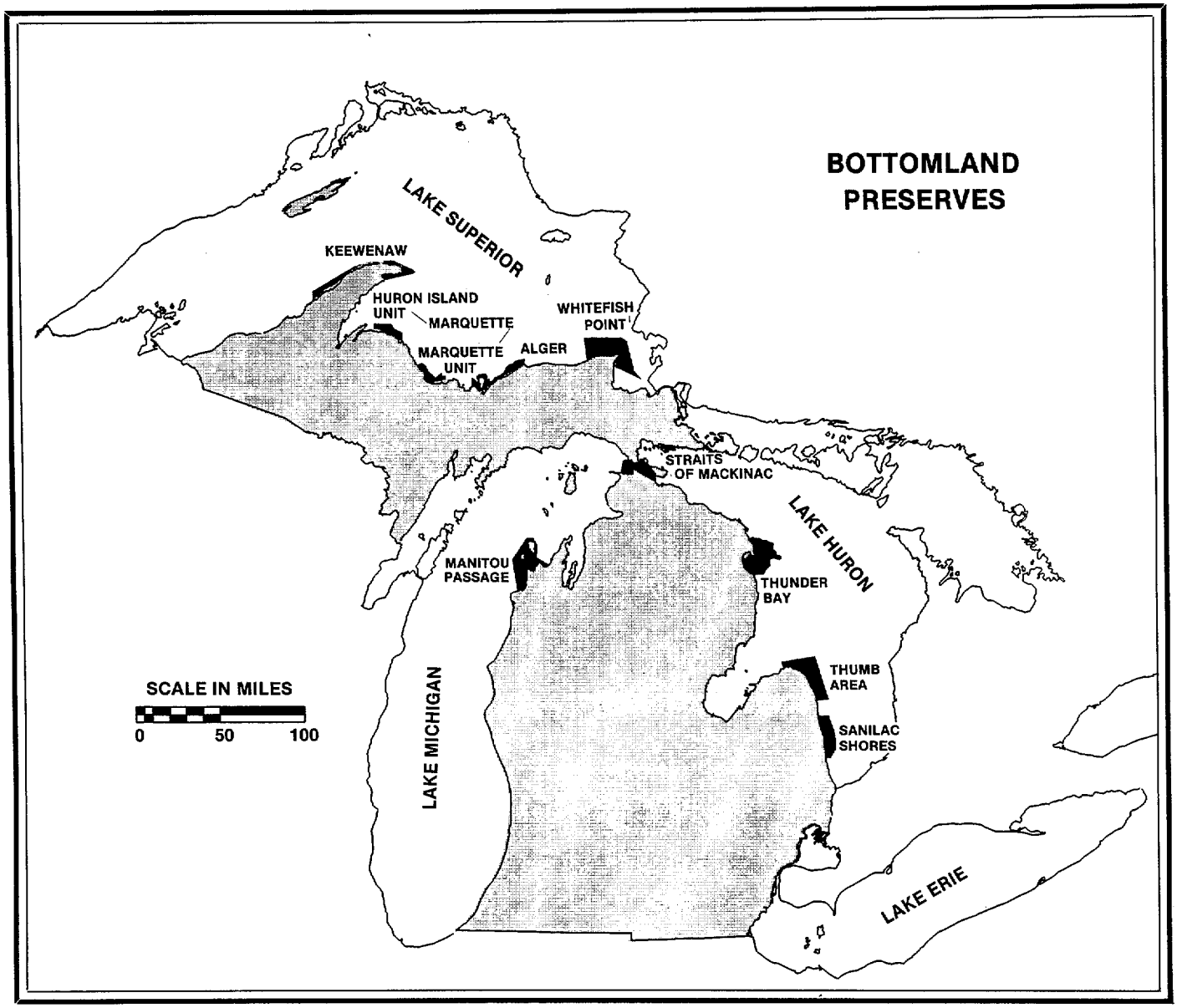
CZM dollars also help provide access to fragile areas while protecting them from destruction. This project is located at Ottawa County's Tunnel Park.

The state also took the lead in developing handicapper access to shoreline recreation projects.

The **Sand Dunes Protection Management Act** (Public Act 222, 1976 as amended by PA 146 and 147 of 1989) regulates the mining of Michigan's unique sand dunes, about 40 percent of which are located on public property. The law permits no construction on dunes with slopes greater than 25 percent. It further requires the continuation of dune inventory and evaluation as well as public education.

The **Great Lakes Underwater Salvage and Preserve Act** (Public Act 452, 1988) has resulted in the creation of seven bottomland preserves that are graveyards for sunken vessels. The preserves total more than 1,500 square miles. Artifacts and timber from the shipwrecks are important parts of Michigan's history, and the law prevents their destruction or unauthorized removal.

The **Goemaere-Anderson Wetland Protection Act** (Public Act 203, 1979) requires a permit to dredge, fill, drain or build structures in any wetland connected to a lake or stream or any isolated wetland that is five acres or larger.

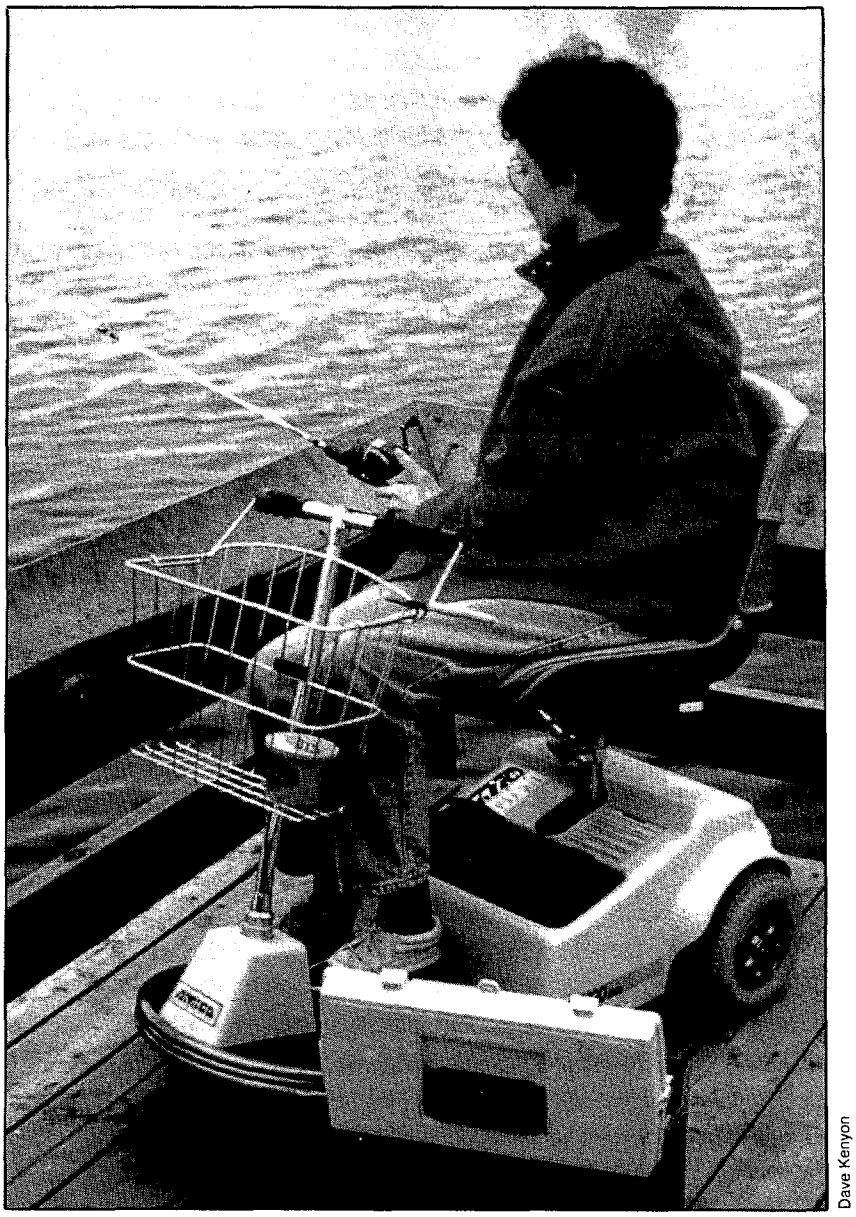


Michigan As a Leader

The CZM program is efficiently administered under the DNR's Land and Water Management Division. It has three key functions: (1) to regulate the resource through enforcement of the six core statutes, (2) to issue grants and lend technical assistance to local governments interested in developing partnership programs, and (3) to review all federal activities to make sure they are consistent with state programs. The U.S. Coast Guard, Army Corps of Engineers, National Park Service and U.S. Forest Service are among those federal agencies whose activities the DNR oversees.

Michigan's leadership experience in managing the state's shorelines has served as a model nationally. Michigan passes through a substantial portion of the federal grant to local communities, and it was the first state to provide funding for construction projects that enhance coastal program objectives. These include improved public access, protection of sensitive coastal resources, and preservation and restoration of historic coastal features. Based on Michigan's successful experience, federal regulations were changed so that all states receiving coastal zone dollars could provide grant monies for low-cost construction projects.

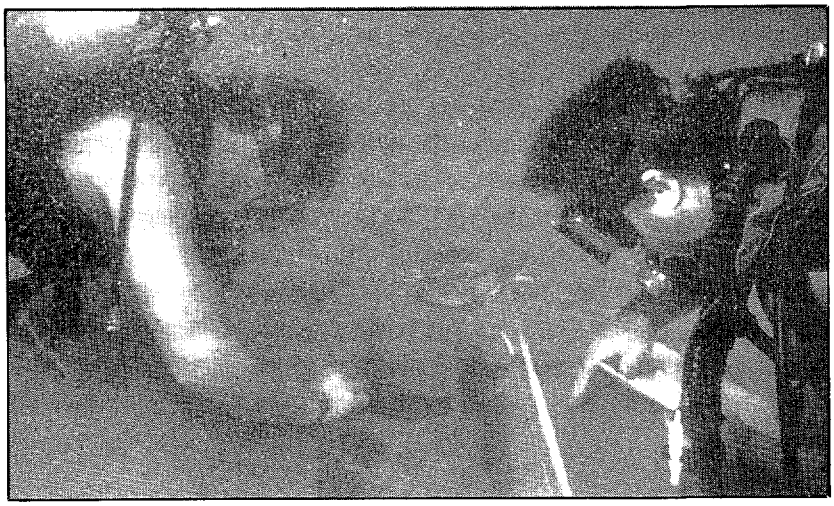
The state also took the lead in developing handicapper access to shoreline recreation projects. Further, Michigan was one of the first states to pass legislation preserving bottomland resources, and it has adopted a comprehensive sand dune protection act. These innovative steps are reasons why Michigan continues to be a leader in coastal zone management.



Dave Kenyon

Facilities for handicapped citizens are an important consideration of all CZM construction projects.

An Enviable Record of Accomplis



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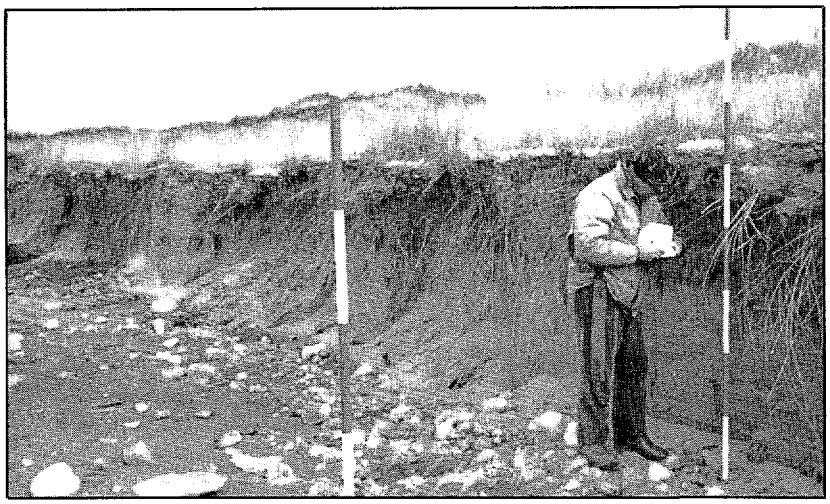


Martin Jannereth

Top: These divers are identifying and inventorying artifacts in the Manitou Underwater Preserve.

Middle: Youngsters enjoy the Lake Michigan beach near Frankfort.

Bottom: The study of long-term erosion effects helps resource managers to better protect Michigan's fragile shorelands.

The National Oceanic and Atmospheric Administration (NOAA) implements the CZMA for the U.S. Department of Commerce. Since the NOAA began providing funds in 1978, Michigan has led the nation in both the number of CZMA projects and amount of federal money awarded to carry them to completion. During a recent three-year period, the state received nearly $8.2 million for a total of 111 approved projects.

This amount was matched with state and local dollars, as well as donations. State funding may come from several sources. These include the General Fund, Recreational Improvement Fund, the Michigan Natural Resources Trust Fund, Protecting Michigan's Future Bond Fund—which voters approved in 1988—and others.

Funding of shoreline projects is considered cost-effective when value outpaces the investment. Some dramatic successes have resulted. Early in the program, for example, the state awarded the City of Detroit $82,000 to prepare a Linked Riverfront Parks Master Plan. That investment resulted in $37 million of additional federal, state and local government funds. In turn, those dollars have stimulated $210 million of private investment in housing, office and commercial development. A total of 1,200 new jobs were created.

The CZMA projects cover a wide variety of initiatives. About 30 to 40 low-cost construction and planning projects are awarded each year to local communities. Most grants range from $5,000 to $50,000 each. Following are descriptions of what Michi-

hment

gan's CZM program does and a few examples of the many accomplishments to date:

Protect Coastal Resources

Grant funds were used to develop a management plan in the St. Clair Flats, a choice marsh environment, which is semi-developed. Researchers from the University of Michigan were able to survey 45 permanent sites on Lakes Huron and Michigan to establish long-term information on the rate of shoreline change. And CZM dollars were used by the DNR to study coastal marshes of 100 or more acres in the Lower Peninsula to see what changes had occurred in the past 50 years. The natural features of about 760 wooded dune and swale sites were inventoried in a two-year study that searched for threatened and endangered plants.

Other projects include publishing an atlas of breeding birds that live along Michigan's coastal zone, identifying piping plover nesting sites on northern Lake Michigan islands, and inventory nesting colonies of great blue herons.

Minimize Loss of Life and Property

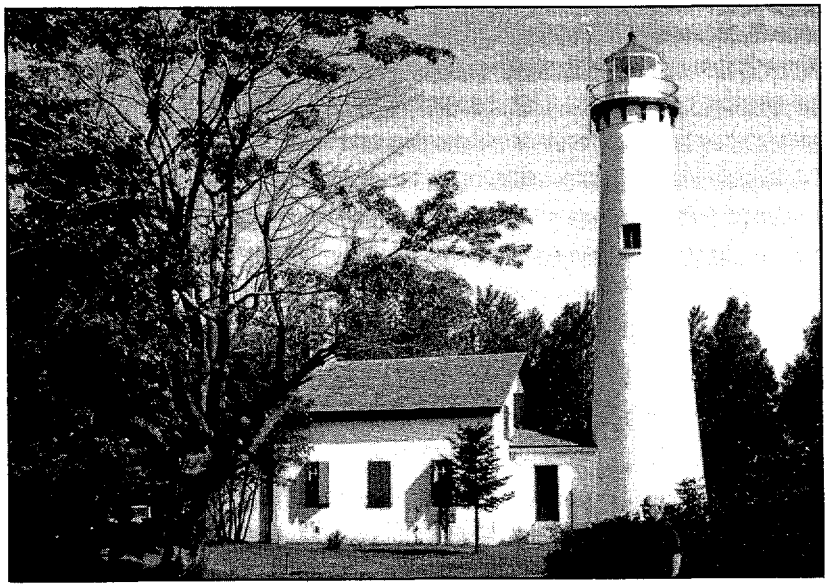
By requiring setbacks from eroding bluff lines, prohibiting construction on steep sand dune slopes, and requiring buildings to be constructed above flood levels, the DNR has helped to minimize the loss of life and property. The CZM program has resulted in many projects to prevent damage and destruction. Sanilac County workers, for example, built a drainage structure to ease erosion at Lexington Park. Riprap construction at Northport and a seawall built at Port Huron protect stream banks from eroding during high water periods.

Buoy systems built and installed at popular shipwreck sites have helped to prevent anchor damage to the sites. The markers have also improved diver safety and aided them in their search for shipwrecks.

The CZM program has resulted in many projects to prevent damage and destruction.

Blanchard Mills

The boardwalk at Cheboygan's Gordon Turner Park allows access to a designated environmental area. An observation tower is included.



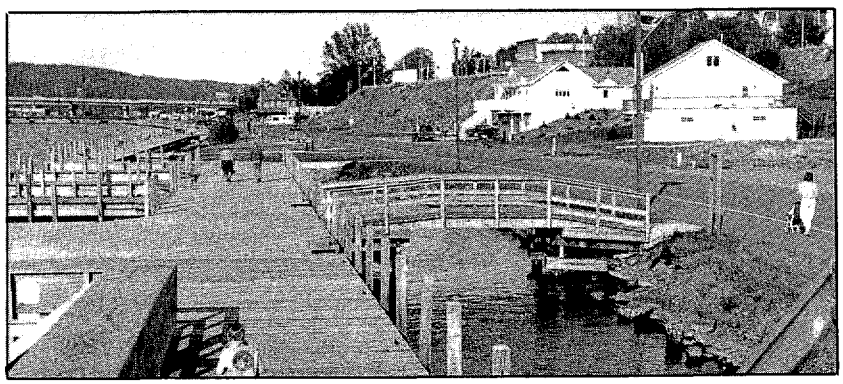
Michael Kessler

Restoration of historical structures like Sturgeon Point Lighthouse in Alcona county is another goal of the CZM program.

The Detroit River plan converted industrial frontage that had been abandoned to a series of parks with linked walkways.

Provide Public Access to the Coast

Coastal communities have matched hundreds of thousands of federal dollars for projects that provide access to coastal resources. A barrier-free boardwalk at Mt. Clemens now provides safe access to the Clinton River. Another boardwalk throughout the City of St. Ignace changed the shoreline character from one which discouraged access to one which encouraged access. The Detroit River plan converted industrial frontage that had been abandoned to a series of parks with linked walkways.



Michael Kessler

Building a dock on old pilings in the Portage Ship Canal at Houghton improved public access.

Bay City State Park and Nayanquing Point Wildlife Area are two of many public properties now featuring handicap accessible walkways and observation decks. Nature trails, hiking and bicycling paths, picnic areas and interpretive centers are other examples of public access projects.

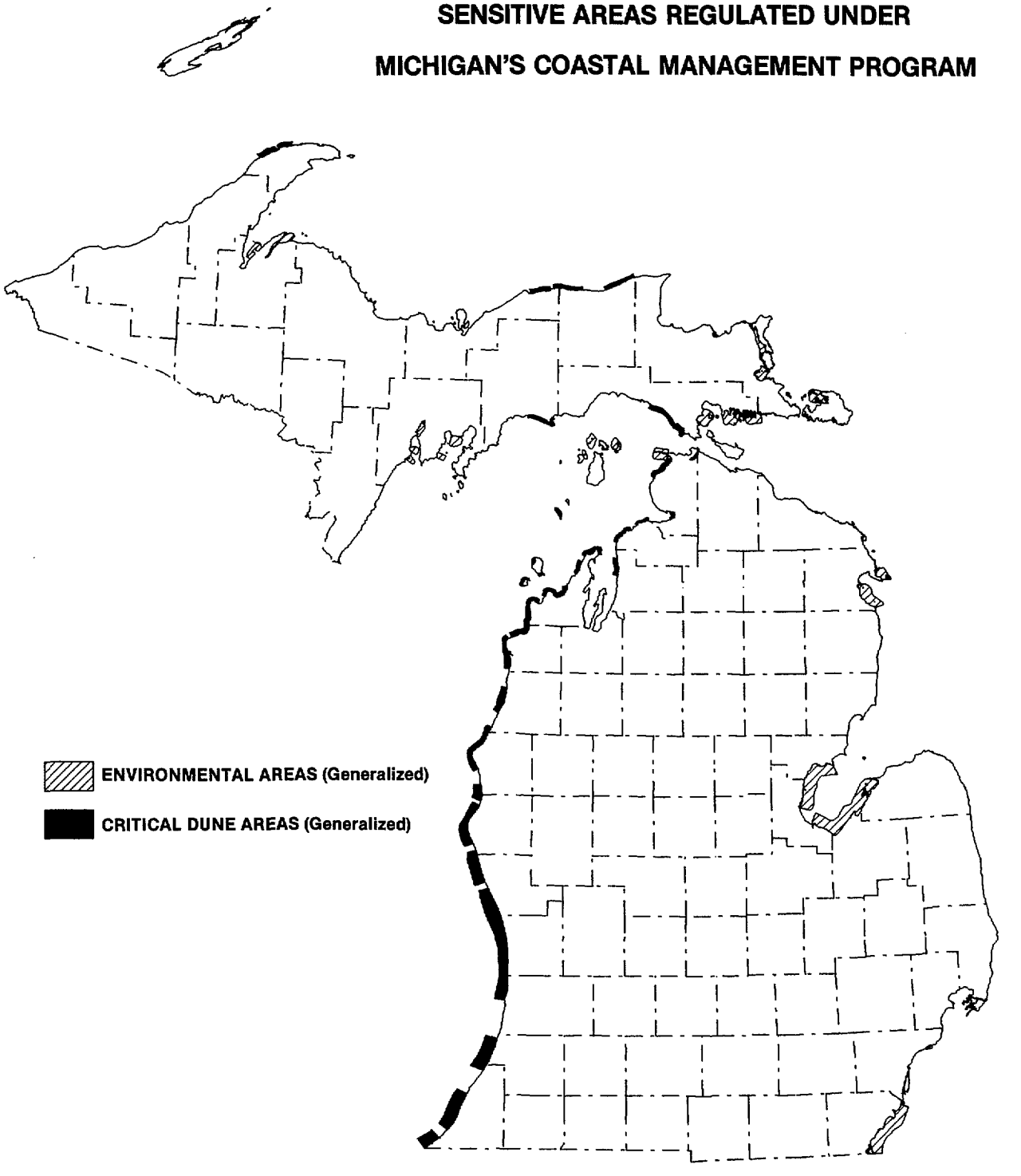
Assist in Economic Development

As noted, the Detroit River plan did much to revitalize the downriver area. Fund dollars have also been used to help plan, engineer and construct waterfront development projects at Alpena, Bay City, Escanaba, Hancock, Elk Rapids, Ludington and many other coastal communities. Planning projects involve studying economic and environmental impacts. Blueprint designs and construction examples include fishing piers, boat launches, docks, marinas, parks and other public facilities.

Preserve and Restore Historic Sites

Historical structures provide clues to our past, and that is why the CZM program has funded their restoration. The Lake Michigan Maritime Museum in South Haven received money to map, excavate and preserve more than 200 artifacts from the shipwrecked *Rockaway.* Deep-water surveys of the *Edmund Fitzgerald* off Whitefish Point and *F. T. Barney* near Rogers City were conducted. Restoration projects include lighthouses at Escanaba and Beaver Island and Mill Creek State Park near Mackinaw City. The Great Lakes Shipwreck Historical Museum at Whitefish Point features exhibits designed and built with CZM dollars.

SENSITIVE AREAS REGULATED UNDER MICHIGAN'S COASTAL MANAGEMENT PROGRAM



Thanks to a data base that allows tracking of permits under several statutes, the DNR now provides a faster and more thorough review of applications.

Provide Educational and Interpretive Displays

In addition to these examples, statewide public information projects include the construction of interpretive signs and large-scale nature center displays. For example, a diorama at Hoffmaster State Park explains sand dune ecosystems throughout the year. Program dollars allowed the DNR's Fisheries Division to publish "Angler's Guide to Michigan's Great Lakes" and to develop the "Wetland Protection Guidebook."

As publishers of *Tracks* magazine, which is designed to teach schoolchildren the importance of conservation, the Michigan United Conservation Clubs devoted entire issues to natural features and inhabitants of the coastal zone. CZM dollars helped make this possible.

Dave Kenyon

The study of beach dune ecology is among several educational projects funded by CZM dollars.

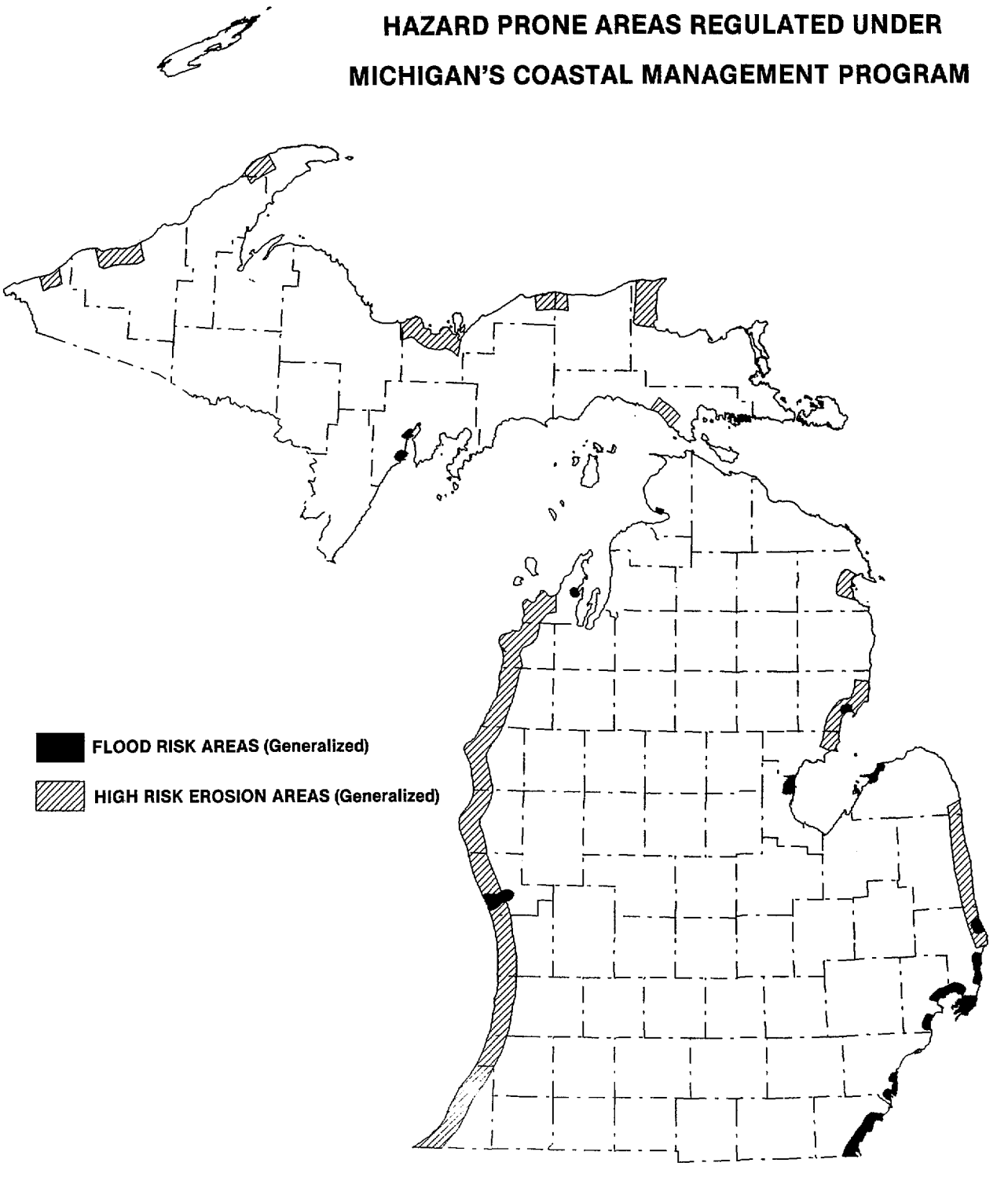
Restore Lost or Damaged Ecosystems

At Saugatuck, engineers devised ways to control traffic and limit erosion on Mt. Baldhead Sand Dune. At St. Joseph, workers planted 94,000 square feet of dune grass at Tiscornia and Lions parks. At Gladstone's Van Cleve Park, they planted trees, shrubs and beach grass to check erosion. They also erected barrier posts, walkways and rustic fencing to direct visitors away from the plantings.

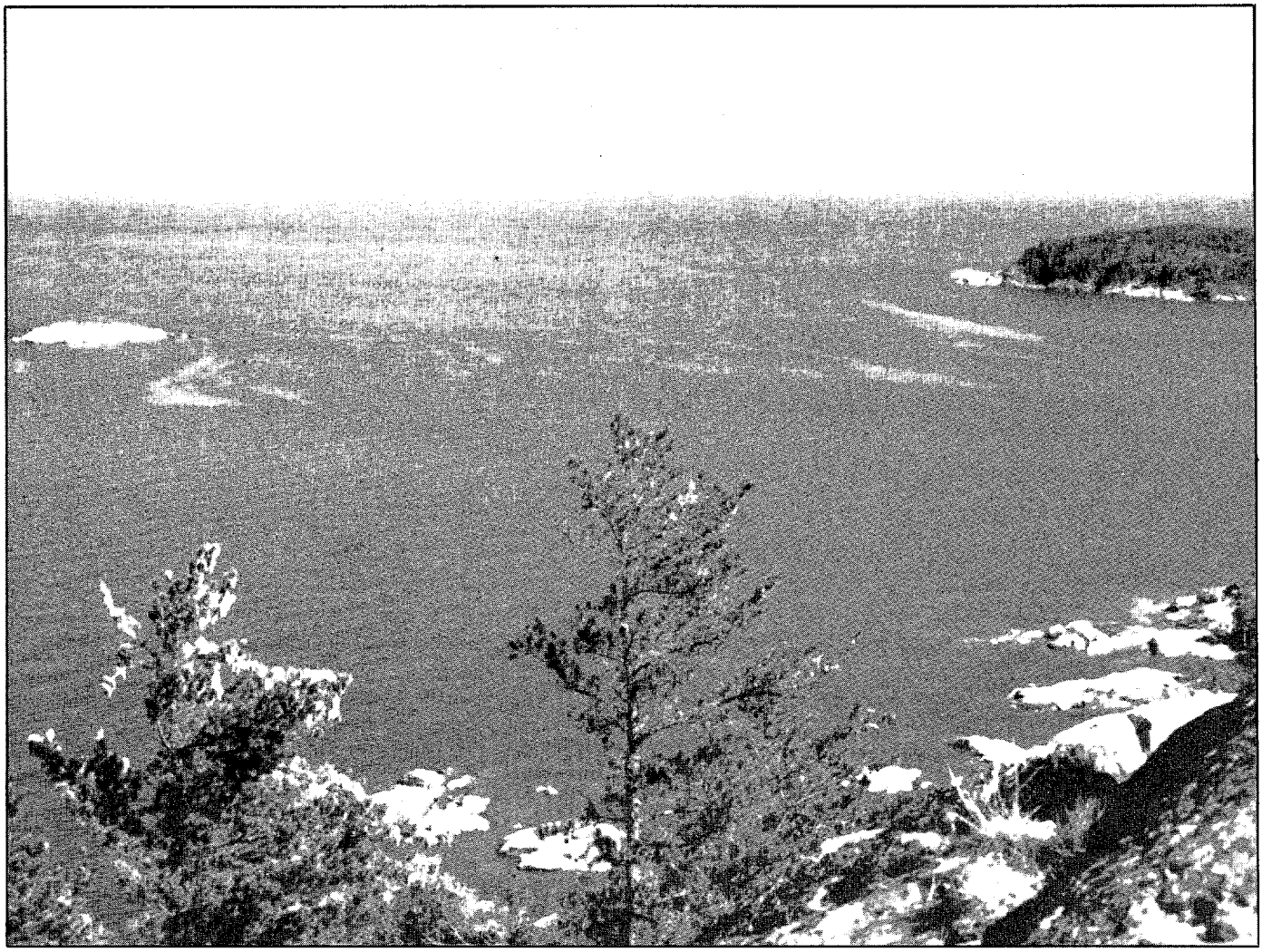
Improve Government Decision Making

Thanks to a data base that allows tracking of permits under several statues, the DNR now provides a faster and more thorough review of applications. The Coastal and Inland Waters Permits Information System (CIWPIS) is also capable of "flagging" areas of special concern. CIWPIS is accessible to all DNR resource managers.

HAZARD PRONE AREAS REGULATED UNDER MICHIGAN'S COASTAL MANAGEMENT PROGRAM



How To Join the CZM Program



Communities have about six weeks or usually until mid February to send in their applications.

Near the end of each calendar year, the DNR's Land and Water Management Division sends an invitation and application form to local units of government. Communities have about six weeks or usually until mid February to send in their applications. The DNR reviews the applications and then sends its recommendations to the federal government. This procedure normally occurs in May. Funds for approved projects become available at the beginning of the next fiscal year, which is October 1. Thus, the amount of time from announcement to application to approval usually takes about nine months.

For more information, contact the DNR Land and Water Management Division at P.O. Box 30028, Lansing, MI 48909 or call 517-373-1950.

The Future of Our Coastlands

Human activity has changed Michigan's coastlands more in the past 200 years than natural forces have been able to do since the last glaciers retreated about 10,000 years ago. Shoreline land values have risen enormously in recent years. They will continue to rise, as more and more people realize their value for residential, recreational, commercial and industrial uses.

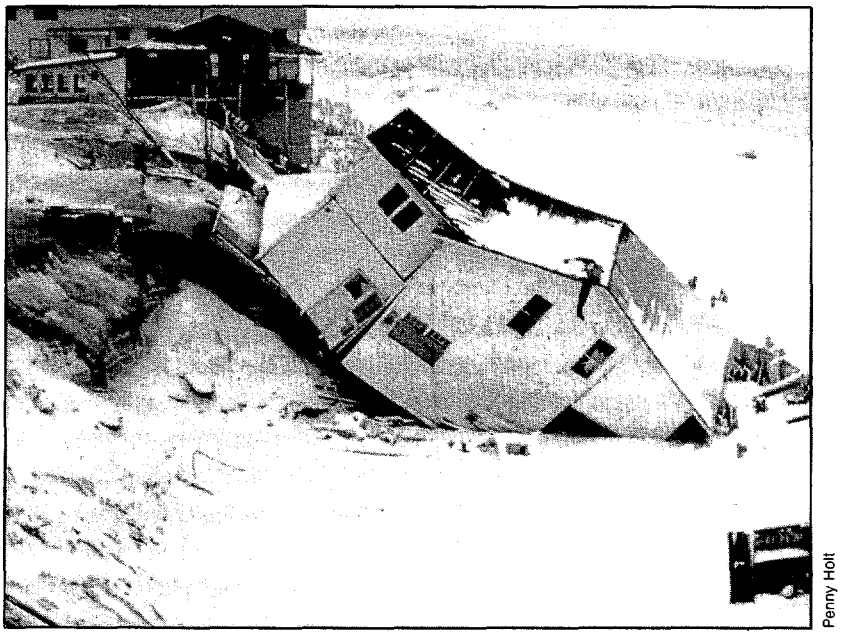
The Great Lakes mid-continent, mid-latitude position makes it subject to extremes of weather such as abrupt changes in barometric pressure and high winds and storms. These storms may cause short-term flooding and erosion. Seasonal fluctuations in water level reflect the annual cycle of precipitation which produces lows in winter and highs in summer.

Long-term natural changes occur during cycles of high and low water. More than 130 years of record keeping indicates there are not regularly predictable cycles of high water/low water, but at least three high-water periods have occurred in the 20th century. Each produced devastating effects on the shoreline, causing erosion and flood damage to homes and other dwellings.

The high water period of 1951-52 caused an estimated loss of $61 million per year. During the period 1972-76, property owners lost $231 million and spent another $170 million on shoreline structures to prevent greater damage. The last high water period of 1985-87 caused an estimated $55 million in erosion damage and prompted another $118 million to be spent on shore protection. The losses would have been much greater without the CZM program.

Because the coastal zone is an area of dynamic change, new issues involving its protection and management are always emerging. Proposals to allow year-round commercial shipping and to divert water from the Great Lakes to other regions continue to be made in spite of the potentially devastating harm to shorelines. Wetlands loss, water quality and pollution problems are still of major concern regardless of some improvement in recent years. Fine-tuning the predator-to-prey balance among fish species and learning to live with exotic invaders like zebra mussels are other concerns. For these reasons responsible management is more important than ever.

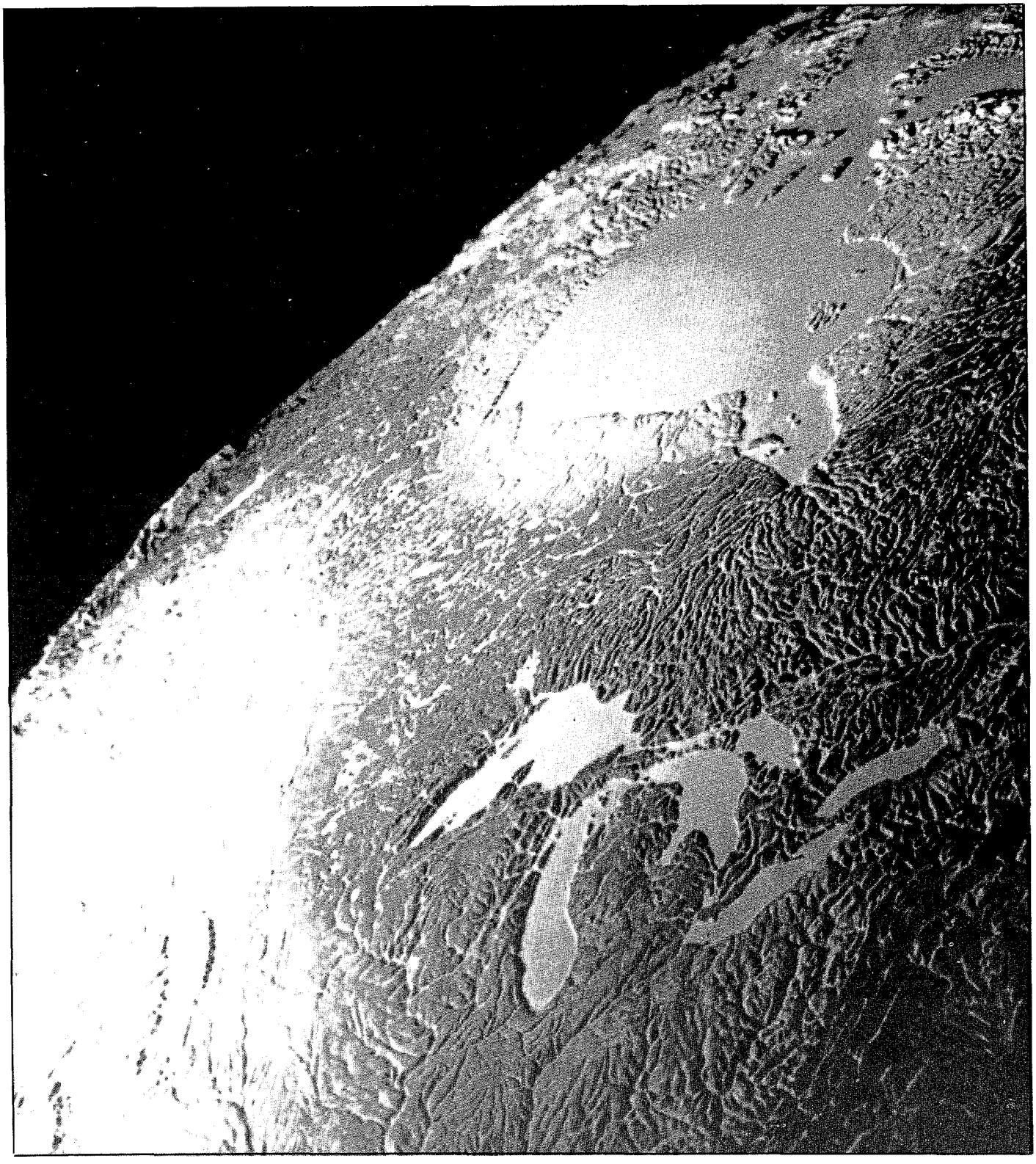
Long-term natural changes occur during cycles of high and low water. Wetlands loss, water quality and pollution problems are still of major concern.



Penny Holt

Erosion caused this house to collapse along Lake Michigan's Stickney Ridge in Ottawa County.

Scan a map of the United States and the eyes will pause on the artistic balance that is Michigan. Viewed from outer space, the two-million-year-old Great Lakes look like azure jewels in a crown of emerald. Closer up, these stunning gems lap shorelines rich with natural resources. But the shorelines are fragile and they are finite. How they fare tomorrow depends upon how well we manage and protect them today.



Dave Kenyon

Questions and Answers About CZM Grants

1. **Who is eligible to apply?**

   —Coastal units of government including cities, counties, villages and townships

   —Area-wide agencies including regional planning agencies

   —State agencies

   —Universities

   —School districts

   —Tribal governments

2. **What kinds of *coastal projects* are eligible for funding?**

   Design Projects:

   —Site design, planning and engineering for recreational sites and waterfront redevelopment

   —Studies for ports and harbors, economic development, protection of coastal resources

   —Feasibility studies

   —Facility relocation studies

   Construction Projects:

   —Building barrier-free projects including boardwalks, scenic overlooks, educational and/or interpretive displays, trails

   —Restoration of historic coastal structures

   —Other coastal-related construction or demolition

3. **When will funds be available?**

   The grant period begins October 1 of each year and ends September 30 of the following year. Approved projects must be started and completed within the grant period.

4. **How do I apply?**

   By **February 15**, submit an application form with required information to:

   Coastal Management Program
   Land and Water Management Division
   Michigan Department of Natural Resources
   P.O. Box 30028
   Lansing, MI 48909
   (517) 373-1950

Ed Bremmer

For more information contact:

DNR Land and Water Management Division
P.O. Box 30028
Lansing, MI 48909
517-373-1950